Claims

1. In a hydraulic directional control valve having a valve body with a slidably positioned valve spool, a first work port, a second work port, a first return port, and a second return port, wherein the first work port and the first return port are fluidly connected by a second passageway on the valve spool when the valve spool is in a float position, wherein second work port and the second return port are fluidly connected by a first passageway on the valve spool when the valve spool is in the float position, and wherein the first work port and second work port are fluidly connected when the valve spool is in the float position, the improvement to the hydraulic directional control valve comprising:

the first passageway on the valve spool being sized such that the flow of hydraulic fluid through the second work port is discouraged, and that flow between the second work port and the first work port is encouraged, when the valve spool is in the float position.

2. The hydraulic directional control valve defined in claim 1, the improvement to the hydraulic directional control valve further comprising:

the second passageway on the valve spool being blocked-off, such that the flow of hydraulic fluid through the first return port is impeded when the valve spool is in the float position.

3. In a hydraulic directional control valve having a valve body with a slidably positioned valve spool, a first work port, a second work port, a first return port, and a second return port, wherein the first work port and the first return port are fluidly connected by a second passageway on the valve spool when the valve spool is in a float position, wherein second work port and the second return port are fluidly connected by a first passageway on the valve spool when the valve spool is in the float position, and wherein the first work port and second work port are fluidly connected when the valve spool is in the float position, the improvement to the hydraulic directional control valve comprising:

the first passageway on the valve spool being sized such that the flow of hydraulic fluid through the second work port is discouraged, and that flow between the second work port and the first work port is encouraged, when the valve spool is

in the float position.

the second passageway on the valve spool being blocked-off, such that the flow of hydraulic fluid from through first return port is impeded when the valve spool is in the float position.

4. In a hydraulic circuit comprising a hydraulic directional control valve having a valve body with a slidably positioned valve spool, a first work port, a second work port, a first return port, and a second return port, the hydraulic circuit additionally comprising a hydraulic cylinder having a cylinder body with a slidably positioned cylinder rod, a rod end port fluidly coupled to the first work port, and a head end port fluidly coupled to second work port, wherein the first work port and the first return port are fluidly connected by a second passageway on the valve spool when the valve spool is in a float position, wherein second work port and the second return port are fluidly connected by a first passageway on the valve spool when the valve spool is in the float position, and wherein the first work port and second work port are fluidly connected when the valve spool is in the float position, the improvement to the hydraulic circuit comprising:

the first passageway on the valve spool of the hydraulic directional control valve being sized such that the ratio of flow through the second return port compared with the flow through the second work port is approximately the ratio of the square of the rod cylinder diameter to the square of the cylinder diameter, when the valve spool is in the float position.

5. The hydraulic circuit defined in claim 4, the improvement to the hydraulic circuit comprising:

the second passageway on the valve spool of the hydraulic directional control valve being blocked-off, such that the flow of hydraulic fluid through the first return port is impeded when the valve spool is in the float position.